

What is claimed is:

1. A system for processing data packets in a data packet network comprising:

5 at least one input port for receiving data packets;
 at least one output port for sending out data packets;
 a processor for processing packet data; and
 a packet predictor for predicting a future packet based on a
received packet, such that at least some processing for the predicted
10 packet may be accomplished before the predicted packet actually arrives
at the system.

2. The system of claim 1 wherein the data packet network is the Internet
network.

3. The system of claim 1 wherein the packet predictor mechanism
utilizes a history record periodically updated by the system, to generate
predicted data.

4. The system of claim 3 wherein the history record comprises
characteristics of recently received data packets.

5. The system of claim 5 wherein the history record further comprises
results of past predictions.

6. The system of claim 1 wherein packet prediction comprises predicting
specific characteristics, comprising one or more of packet type, packet
flow identification, sender information, destination information, and
packet size.

7. The system of claim 1 comprising a packet router.

8. The system of claim 1 comprising a data server.

9. A packet predictor for enhancing a data packet processor,
comprising:

5 an input for receiving information about a first packet received
for processing;

 a predictor for predicting characteristics of a packet to arrive at a
later time, based upon the information received about the first packet;
and

10 an output for providing the predicted characteristics to the
processor for processing ahead of arrival of a real packet fulfilling the
prediction.

10. The packet predictor of claim 9 wherein the data packet processor
15 comprises a data router operating on the Internet network.

11. The packet predictor of claim 7 comprising a history record
consulted each time a prediction is made.

20 12. The packet predictor of claim 11 wherein the history record
comprises history of real packets received and processed.

13. The packet predictor of claim 11 wherein the history record
comprises history of predictions and result of the predictions.

25 14. The packet predictor of claim 9 wherein the history record is stored
in a memory accessible to the mechanism.

30 15. The packet predictor of claim 9 wherein packet prediction comprises
predicting specific characteristics, comprising one or more of packet
type, packet flow identification, sender information, destination
information, and packet size.

16. The packet predictor of claim 7 wherein the data packet processor comprises a data server.

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17. A method for reducing latency in packet processing for a packet processor, comprising the steps of:

(a) speculatively predicting characteristics of packets yet to arrive for processing, based on packets actually received for processing; and

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(b) accomplishing speculative processing on the predicted characteristics.

18. The method of claim 17 wherein the packet processor is coupled with a data packet network.

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19. The method of claim 18 wherein the data packet network is the Internet network.

20. The method of claim 15 comprising a step for maintaining a history of either or both of packets actually received and results of prior predictions.

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21. The method of claim 20 wherein the history for received packets comprises one or more of packet type, packet flow identification, sender information, destination information, and packet size.

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22. The method of claim 17 wherein in step (b) the speculative processing is abandoned if it is determined not to agree with the real data once it arrives.

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23. The method of claim 21 wherein speculative processing is accomplished only on selected predicted characteristics of the predicted data packet.

5 24. The method of claim 17 wherein in, if some of the results from processing the predicted characteristics are wrong they are abandoned, and results which are correct are retained, to reduce processing for an arriving packet based on the prediction.

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